

MSCI Quality Indices Methodology

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About MSCI

Section 1: Introduction

The MSCI Quality Indices aim to reflect the performance of a Quality growth strategy. Quality growth companies are characterized in the literature as companies with durable business models and sustainable competitive advantages. Quality growth companies tend to have high ROE, stable earnings that are uncorrelated with the broad business cycle, and strong balance sheets with low financial leverage. Many active strategies emphasize Quality growth as an important factor in their security selection and portfolio construction.

MSCI categorizes the MSCI Quality Indices as Risk Premia Indices, which reflect the systematic elements of particular investment styles or strategies. While capitalization weighted indices represent the broad market beta, investors increasingly recognize that there are additional sources of systematic return associated with particular investment styles and strategies, such as value, momentum, volatility, etc, that could be represented through alternatively weighted indices. The Quality factor is complementary to other systematic risk premia such as Size, Value, Low Volatility and may provide diversification to a portfolio of risk premia.

The MSCI Quality Indices aim to capture the Quality factor with a simple and transparent methodology while ensuring reasonably high trading liquidity and investment capacity of constituent companies, as well as moderate Index turnover. Quality is an objective measure of certain historical variables and is not an endorsement or recommendation by MSCI as to the future performance of any constituents or the index.

The main potential applications by institutional investors of the MSCI Quality Indices include:

- Strategic asset allocation: seeking equity market exposure to the Quality factor
- Portfolio diversification: combined with other systematic risk premia
- Investment research: tools to study the characteristics of Quality strategies

Section 2: Index Construction Methodology

Section 2.1: Applicable Universe

The applicable universe includes all the existing constituents of an underlying MSCI Parent Index (herein, a "Parent Index"). This approach aims to provide an opportunity set with sufficient liquidity and capacity. The relevant MSCI Parent Index would be any country or regional Index.

Section 2.2: Determination of Quality Score

The Quality score for each security is calculated by combining Z scores of three winsorized fundamental variables, namely Return on Equity, Debt to Equity and Earnings Variability. The details of the calculation of the fundamental variables are provided in Appendix I.

2.2.1: Winsorizing the variable

As part of the standardization process, outlier fundamental variable values are winsorized to ensure that the average values used to standardize the variables are less affected by extreme values. To do this, for a given variable, the values for all securities are first ranked in ascending order within each MSCI Parent Index. Missing values are excluded from the ranking. Then, for securities that lie below the 5th percentile rank or above the 95th percentile rank, their value is set equal to the value of the 5th percentile ranked or 95th percentile ranked security, as applicable. This process is repeated for each of the three fundamental variables.

Example: Winsorization

For example, assume there are 200 securities ranked in ascending order of the variable value. The 5th percentile security is the 10th ranked security and the 95th percentile security is the 191st ranked security. For all the securities ranked from 1 through 9, their values become equal to the value of the 10th ranked security. Meanwhile, for all securities ranked from 192 through 200, their values become equal to the value of the value of the 191st ranked security.

2.2.2: Calculating the Z-Scores

After winsorizing all the three variables within each MSCI Parent Index, the Z-Score for each of the three variables for each security can be calculated using the mean and standard deviation of the relevant variable within each MSCI Parent Index. Computing a Z-Score is a widely used method of standardizing a variable in order to combine it with other variables that may have a different unit of measurement or a different scale. Because it has a mean value of zero and a standard deviation of 1, the value of a z-score shows how many standard deviations a given value lies from the mean.

The Z-Score is defined as follows for ROE (Return on Equity):

$$z = \frac{(x-\mu)}{\sigma}$$

Where:

• *x* is the winsorized variable for a given security



- μ is the mean of the winsorized variable in the MSCI Parent Index Universe, excluding missing values
- σ is the standard deviation of the winsorized variable in the MSCI Parent Index Universe, excluding missing values

The Z-Score is defined as follows for the **Debt to Equity and Earnings Variability:**

$$z = -\frac{(x-\mu)}{\sigma}$$

A negative Z score is calculated to ensure that a security having higher Debt to Equity or higher Earnings Variability gets a lower respective Z-Score.



2.2.3: Calculating the Quality Score

After standardizing each of the three variable values for each security, MSCI calculates a composite Quality Z-Score for each security. The Quality Z-Scores are computed by averaging the Z scores of all the three fundamental descriptor as calculated in section 2.2.2. Computation of the Quality Z Score also depends on the availability of fundamental variables as described in Appendix II.

The Quality Score is then computed from the composite Quality Z Score as follows:

Quality Score =
$$\begin{cases} 1 + Z &, Z > 0 \\ (1 - Z)^{-1} &, Z < 0 \end{cases}$$

Where Z is the composite Quality Z Score determined in the previous step.

Section 2.3: Security Selection

The MSCI Quality Indices are constructed with a fixed number of securities approach. All the existing constituents of the relevant MSCI Parent Index are ranked based on their Quality Scores. If multiple securities have the same Quality Score, then the security having a higher weight in the Parent Index is given a higher rank. A fixed number of securities with the highest positive Quality Scores are predetermined for every MSCI Quality Index at initial construction with an aim to attain a high exposure to the Quality factor while maintaining sufficient index market capitalization and number of securities coverage. Rules for arriving at a fixed number of constituents at initial construction is evaluated at every Semi-Annual Index Review(SAIR) to ensure that the Quality universe has sufficient index market capitalization coverage. Rules for evaluating the fixed number of constituents at every SAIR are explained in Appendix III

Section 2.4: Weighting Scheme

For a given rebalancing effective date, all the securities eligible for inclusion in the MSCI Quality Indices are weighted by the product of their market capitalization weight in the Parent Index and the Quality Score.

Quality Weight = Quality Score * Market Capitalization Weight in the Parent Index

The above weights are then normalized to 100%. The final security level inclusion factor is determined as the ratio of the final security level weight and the security level pro forma market capitalization weight in the relevant MSCI Parent Index. To mitigate the impact of stock-specific risk, the issuer weight will be capped at a specific level as described in Appendix IV.

Section 3: Maintaining MSCI Quality Indices

Section 3.1: Semi-Annual Index Reviews

The MSCI Quality Indices are rebalanced on a semi-annual basis, usually as of the close of the last business day of May and November, coinciding with the May and November Semi-Annual Index Review of the MSCI Global Investable Market Indices. Fundamental variables as of the end of April and October are used respectively. This approach aims to capture timely updates to Quality characteristics of the companies and coincides with the rebalancing frequency of the relevant MSCI Parent Indices. The pro forma MSCI Quality Indices are in general announced nine business days before the effective date.

Section 3.1.1: Buffer Rules:

To reduce Index turnover and enhance Index stability, buffer rules are applied at 20% of the fixed number of securities in the MSCI Quality Indices.

For example, the MSCI World Quality Index targets 300 securities and the buffers are applied between rank 241 and 360. The securities in the MSCI Parent Index with a Quality rank at or above 240 will be added to the MSCI World Quality Index on a priority basis. The existing constituents that have a Quality rank between 241 and 360 are then successively added until the number of securities in the MSCI World Quality Index reaches 300. If the number of securities is below 300 after this step, the remaining securities in the Parent Index with the highest Quality Score rank are added until the number of securities in the MSCI World Quality Index reaches 300.

Section 3.2: Ongoing Event Related changes

In general, the MSCI Quality Indices follow the event maintenance of the MSCI Parent Index.

Section 3.2.1: IPOs and other early inclusions

IPOs and other newly listed securities will only be considered for inclusion at the next semi-annual Index review in the MSCI Quality Index, even if they qualify for early inclusion in the MSCI Parent Index.

Section 3.2.2: Additions and Deletions due to corporate events

The general treatment of additions and deletions due to corporate events aims at minimizing the turnover in the MSCI Quality Indices. A constituent deleted from the MSCI Parent Index following a corporate event or during the Quarterly Index Review of the Parent Index will be simultaneously deleted from the MSCI Quality Index.

Please refer to Appendix V for more details on the treatment of corporate events.

Appendix I: Calculation of Fundamental Variables

Fundamental Variable	Calculation Details			
<u>Return on Equity</u> (ROE)	(ROE) is calculated using the trailing 12 month earnings per share figure and latest book value per share			
	ROE = <u>Trailing 12 month earnings per share</u> Latest Book Value Per Share			
	Debt to Equity is calculated using the latest fiscal year Total Debt and Book Value			
<u>Debt to Equity(D/E)</u>	D/E = <u>Total Debt</u> Book Value			
<u>Earnings Variability</u>	Earnings Variability is defined as the standard deviation of y-o-y earnings p share growth over the last five fiscal years			

For more details on the fundamental data, please refer to the MSCI Fundamental Data Methodology (<u>http://www.msci.com/products/indices/country_and_regional/all_country/methodology.html</u>).

Appendix II: Quality Z Score Computation

Computation of the Quality Z Score also depends on the availability of fundamental variables as described below:

Case	Detail	Action	
<u>Case 1</u>	ROE is missing	If ROE is missing, Composite Quality Z Score is not calculated and the security will not be part of the MSCI Quality Index	
<u>Case 2</u>	Debt to Equity is missing, but other two variables are available	Composite Quality Z Score is calculated using ROE and Earnings Variability Z Scores	
<u>Case 3</u>	Earnings Variability is missing, but other two variables are available	Composite Quality Z Score is calculated using ROE & Debt to Equity Z Scores	
<u>Case 4</u>	Debt to Equity and Earnings Variability are missing but ROE is available	Composite Quality Z Score is not calculated and the security will not be part of the MSCI Quality Index	
<u>Case 5</u>	All three variables are missing	Security will not be part of the MSCI Quality Index	

Appendix III: Rules To Determine Fixed Number of Securities at Initial Construction and in Ongoing Rebalancing

Algorithm to Determine Fixed Number of Securities at Initial Construction



Rounding Off Rules:

Upward rounding off is done depending on NumSec Obtained in the Previous Box Step

- If NumSec in Previous Step < 100, Nearest Rounding = 10 Securities
- If NumSec in Previous Step > = 100 but < 300, Nearest Rounding = 25 Securities
- If NumSec in Previous Step >= 300, Nearest Rounding = 50 Securities

Examples: Initial Construction, major Regions as of May 2012

Region	Parent Num Sec Nu	um Sec for 30% Mcap	Final Num Sec	Mcap Coverage	Num Sec Coverage
ACWI	2448	479	500	31.3%	20.4%
World	1629	291	300	31.1%	18.4%
EM	820	187	200	32.8%	24.4%
Europe	448	102	125	39.0%	27.9%
USA	605	114	125	32.3%	17.7%

MSCI Quality Indices Initial Construction as of 1 June, 2012

Algorithm to reevaluate Fixed Number of Securities at Semi Annual Rebalancing



Appendix IV: Issuer Weight Capping

For Broad Regional/Country Indices issuer weight is capped at 5%. For other narrow Country/Regional Indices issuer weight is capped at a maximum of 10% and maximum issuer weight in the Parent Index.

Cap for narrow Country/Regional Indices = max (10%, maximum issuer weight in the parent index)

For the following broad regional Quality Indices, the issuer weight is capped at 5%:

- 1. MSCI ACWI Quality Index
- 2. MSCI World Quality Index
- 3. MSCI EM Quality Index
- 4. MSCI Europe Quality Index
- 5. MSCI USA Quality Index

Appendix V: Corporate Events Treatment

This appendix describes the treatment of the most common corporate events in the MSCI Indices. Details regarding the treatment of all other corporate events not covered in this appendix can be found in the MSCI Corporate Events Methodology book, available at

http://www.mscibarra.com/products/indices/international_equity_indices/gimi/stdIndex/methodology.html

Event Type	Event details	Action	
	Quality Index constituent acquires another Quality Index constituent	Maintain acquiring company and remove acquired company	
Acquisition	Quality Index constituent acquires non Quality Index constituent	Maintain acquiring company	
	Non Quality Index constituent acquires Quality Index constituent	Remove acquired company without adding acquiring company	
	Quality Index constituent merges with Quality Index constituent	Add new company with a constraint factor that is the weighted average of the two constituents	
Merger	Quality Index constituent merges with non Quality Index constituent	Add new company if MSCI links its price history to the Quality Index constituent. New company not added if price history is linked to the non Quality Index constituent	
IPO	IPO added to Parent Index	Security will be considered for inclusion in the Quality Index at the next Semi-Annual Index Review	
Quality Index constituent spins offSpin-off		Add spun-off security to the Quality Index with the constraint factor of the spinning security, if it is included in the Parent Index	
Security A converted to B, AConversiondeleted from Parent Index, Badded		B inherits constraint factors from A	
Country Reclassification	Domicile of company reviewed: Security A deleted from country A, security B added to country B	B inherits constraint factors from A if it is added to the Parent Index	

Event Type	Event details	Action
Stock exchange reclassification	Stock exchange (price source) of company reviewed: Security A deleted, security B added	B inherits constraint factors from A if it is added to the Parent Index
Other Events Resulting in Changes in Number of Shares and FIFs	Changes in number of shares and subsequent FIF resulting from other events such as share placements and offerings, and debt-to-equity-swaps	No change in Constraint Factor

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The company's flagship product offerings are: the MSCI indices which include over 148,000 daily indices covering more than 70 countries; Barra portfolio risk and performance analytics covering global equity and fixed income markets; RiskMetrics market and credit risk analytics; ISS governance research and outsourced proxy voting and reporting services; FEA valuation models and risk management software for the energy and commodities markets; and CFRA forensic accounting risk research, legal/regulatory risk assessment, and due-diligence. MSCI is headquartered in New York, with research and commercial offices around the world.